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Changes in the High-Latitude Topside Ionospheric Vertical Electron-Density Profiles in Response to Solar-Wind Perturbations During Large Magnetic Storms

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The latest results from an investigation to establish links between solar-wind and topside-ionospheric parameters will be presented including a case where high-latitude topside electron-density Ne(h) profiles indicated dramatic rapid changes in the scale height during the main phase of a large magnetic storm (Dst < -200 nT). These scale-height changes suggest a large heat input to the topside ionosphere at this time. The topside profiles were derived from ISIS-1 digital ionograms obtained from the NASA Space Physics Data Facility (SPDF) Coordinated Data Analysis Web (CDAWeb). Solar-wind data obtained from the NASA OMNIWeb database indicated that the magnetic storm was due to a magnetic cloud. This event is one of several large magnetic storms being investigated during the interval from 1965 to 1984 when both solar-wind and digital topside ionograms, from either Alouette-2, ISIS-1, or ISIS-2, are potentially available.